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ABSTRACT

Eleven preschool play centers in a preschool classroom were randomly sampled and observed during children's free play. Frequency of use, frequency of social and nonsocial behaviors, and quality (positive or negative) of social interactions occurring within them were recorded. A time-sampling procedure was used to obtain data. A total of 160 observation segments were obtained for each center. Attending the center were 24 middle class children (8 males, 16 females) with a mean age of 66 months. Two Log-linear analyses, each of which permitted the simultaneous comparison of all 11 play centers, indicated that play centers differed in frequency of use and that, overall, children engaged in more social than nonsocial and more positive than negative behaviors. A significant statistical interaction between the variables of play center and social/nonsocial behavior indicated that more social behavior occured in some play centers than in others. A significant play center by positive/negative social behavior interaction indicated that more positive social behavior occurred in some of the centers and more negative social behavior occurred in others. A significant play center by gender interaction indicated that boys and girls differed in the frequency with which they played in the various centers. The social/nonsocial behavior by gender interaction, the positive/negative behavior by gender interaction, and the three-way interactions were not statistically significant. (Author/RH)

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The Effects of Play Materials on Positive and Negative Social Behaviors in Preschool Boys and Girls

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Running head: PLAY MATERIALS AND SOCIAL BEHAVIOR

Abstract

Eleven preschool play centers were randomly sampled and observed during free play. Their frequency of use, the frequency of social and nonsocial behaviors, and the quality (positive or negative) of social interactions occurring within them were recorded. Two Log-linear analyses, each of which permitted the simultaneous comparison of all 11 play centers, indicated that play centers differed in frequency of use, and that, overall, children engaged in more social than nonsocial and more positive than negative behavior. A significant play center by social/nonsocial behavior interaction indicated that more social behavior occurred in some play centers than in others. A significant play center by positive/negative social behavior interaction indicated that more positive social behavior occurred in some of the centers and more negative social behavior occurred in others. A significant play center by gender interaction indicated that boys and girls differed in the frequency with which they played in the various centers. The social/nonsocial behavior by gender interaction, the positive/negative behavior by gender interaction, and the three-way interactions were not significant.

For over 50 years play materials and centers, and their influence on preschool children's behavior, have been topics of research. Recently, suggestions that play objects may be used to enhance peer relationships have been made (Hendrickson, Strain, Tremblay, & Shores, 1981). However, two serious limitations affect the reliability of the research findings. First, the play centers themselves have not been systematically sampled and observed. Rather, the behavior of the children selected for study has been observed, and play center data have been obtained because the selected children, during their turn to be observed, happened to be playing in the play centers.

The second limitation has resulted from the unavailability of a data-analysis technique which permits a number of categorical variables, such as play centers, to be compared simultaneously. With commonly-used statistical procedures such as chi-square only two variables can be compared at a time. Consequently, data have been presented in the form of simple frequency counts or percentages of childrens behaviors while they used various centers or materials (e.g., Shapiro, 1975). Chi-square tests used by some investigators (e.g., Shure, 1963) have indicated overall differences among play-center categories (e.g., gender differences in play-center preference), but chi-square does not permit the comparison of every category to every other category. Some investigators (e.g., Clark, Wyon, & Richards, 1969) have used multiple chi-square tests to compare all the categories but have failed to adjust the error rate to

compensate for the numerous tests performed on the same variables. The advent of log-linear techniques, which permit nominal data to be analyzed and interpreted in a similar manner to the analysis of variance of continuous data, now makes possible the simultaneous comparison and examination of the categories of play center data.

Despite the methodological difficulties, research has been consistent in showing that some play centers are more popular than others, even though agreement is not always reached on which centers are the most frequently used. Housekeeping (McDowell, 1937; Parten, 1933), manipulatives (McDowell, 1937), sand (Parten, 1933), art and books (McDowell, 1937; Shure, 1963) have been shown to be popular centers.

The studies are also consistent in showing gender differences in preference for the different centers. Girls' preference for the housekeeping center has been observed over several generations (Clark, Wyon, & Richard, 1969; McDowell, 1937; Tizard, Philips, & Plewis, 1976). Girls also have been reported to use art materials (Shure, 1963; Rubin, 1977); and puzzles (Clark, et al 1969) more frequently than boys.

The incidence of social and nonsocial behavior appears to be different in the various play centers. Parten (1933) observed that the most complex social behavior occurred in her combination doll and housekeeping center. With the doll and housekeeping centers separated, Shapiro (1975) and Shure (1963) also found that the most complex social interactions occurred in the doll center. Rubin (1977)

observed the highest frequency of social interaction during houseplay and the lowest during painting and art activities.

Observations that most social behavior is positive, with negative social interactions being infrequent at the preschool level, are consistent across studies (e.g., Campbell & Cluss, 1982). However, when they do occur, negative behaviors are more likely to take place in some play centers than in others. More negative behaviors have been observed in the doll and block areas than in the other play centers (Shapiro, 1975; Shure, 1963).

In the present study 11 play centers in a preschool classroom were randomly and systematically observed. The frequency with which the children used each play center, engaged in social and nonsocial activities in each play center, and interacted positively (cooperatively and negatively (hostilely) with each other in each play center were studied. Also evaluated were gender differences in play-center preference and in the quantity and quality of social behaviors emitted in the particular play centers. To avoid the methodological problems of previous work, several steps were taken. First, the play centers were randomly and systematically sampled and observed, and the behaviors occurring within them were recorded. Thus, observations of the play centers were not coincidental to observations of target children. Second, the 11 play centers were simultaneously compared by means of a log-linear analysis, which permitted all of these categorical variables to be compared, one to the other, in the same analysis.

Method

A time-sampling procedure in which 5-second observation periods were followed by 10-second recording periods was used to obtain observations of 11 play centers. Observations extended over a semester and were made during 1 1/2 hour free-play periods. A total of 160 observation segments were obtained for each center. The play centers were located in a classroom in which 24 middle SES children (8 males, 16 females, mean age, 66 months) were enrolled. The centers were observed during free play when the children could choose the areas (centers) in which to play and could move from one center to another as they wished. During this time teachers did not interfere in any way with children's choice of play materials or centers. The eleven play centers observed were: art, books, dolls/dollhouse, housekeeping, language, manipulatives, math, painting, puzzles/games, sand, and woodworking. Table 1 presents a description of the centers.

Insert Table 1 about here

The play centers were observed in a randomly-assigned order, with a different order being established each day. The observers recorded the information for each center during two successive observation and recording periods. After these two observation segments were completed for a center, the observers rotated in a predetermined manner to the next play center. After the last center was observed the process was repeated.

Data recorded were: (a) the name of each child in the center, (b) whether each child engaged in nonsocial or social activity, and (c) in the event of social activity whether the child's behavior was positive or negative. Nonsocial behavior was defined as solitary or parallel play in which there was no physical or verbal engagement with another child. Positive social behavior was defined as physical or verbal engagement with another child in an associative or cooperative way. Negative social behavior was defined as physical or verbal expression of unfriendliness or hostility toward another child.

To evaluate reliability two observers, using syncronized procedures, observed simultaneously to obtain 32 samples. Interobserver agreement was calculated using the formula: number of agreements divided by the sum of agreements and disagreements. The average interobserver agreement was 93%.

Results

To compare the play centers for frequency of use and for the occurrence of social and nonsocial behaviors by boys and girls, the data were tabulated in a three-way, 11 (play center) x 2 (social/nonsocial behavior) x 2 (gender) contingency table and analyzed by a log-linear analysis. Table 2 presents this contingency

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Insert Table 2 about here

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table. Log-linear analysis parallels somewhat the analysis of variance in identifying effects and interactions. The effects that were of primary interest here were those related to play center, that is, the

play center main effect and the interactions of play center with the other variables. However,all main effects--play center, social/nonsocial behavior, and gender--were significant, $p < .001$. The play center difference indicated that some centers were more frequently used than others (that is, more behaviors, both social and nonsocial, were observed in some centers because more children occupied those particular centers). As shown in Table 2 the housekeeping center was most frequently used. The art and books center were also popular. Least frequently used were the language, dolls/dollhouse, and manipulatives centers. The social/nonsocial behavior difference indicated that, overall, more social than nonsocial behavior was observed. The gender difference, which simply reflected the difference in the number of boys and girls in the classroom, was irrelevant. The play center by gender interaction was of interest here.

The play center by social/nonsocial behavior interaction, $p < .001$, and the play center by gender interaction, $p < .001$, were significant. An inspection of the z values and residuals indicated that for the play center by social/nonsocial behavior interaction, more social than nonsocial behavior occurred in the following centers: dolls/dollhouse, games, woodworking, housekeeping, sand, and manipulatives. More nonsocial than social behavior occurred in the following centers: language, paint, books, and art.

The significant play center by gender interaction indicated that boys and girls showed different preferences for the different centers.

Further examination of z values and residuals showed that these differences were primarily in the woodworking and manipulatives centers, where boys outnumbered girls in ratios (corrected for unequal numbers of boys and girls in the sample) of 6 1/2 to 1 and 150 to 1, respectively. Boys also outnumbered girls in the language center. Girls outnumbered boys in the paint, housekeeping, and games centers and slightly outnumbered them in the art and books centers.

Neither the social behavior by gender interaction nor the three-way interaction was significant. Thus, boys and girls did not differ in frequency of social and nonsocial behaviors in any of the centers.

To ascertain whether differences in the quality of social behavior (i.e., positive or negative social behaviors) occurred as a function of play center or gender, the data were again tabulated in a three-way, 11 (play center) x 2 (positive/negative behavior) x 2 (gender) contingency table and analyzed by a log-linear analysis. Each main effect was significant, $p < .001$. The play-center difference indicated, as shown by the first analysis, that more behaviors (both positive and negative) occurred in some centers than in others. The positive/negative behavior difference indicated that, overall, more positive than negative behavior was observed. The gender difference again simply reflected the difference in the number of boys and girls in the classroom.

The positive/negative behavior by play center interaction was significant, $p = .05$. An inspection of z values and residuals

indicated that even though the incidence of negative behaviors was low in all centers, the highest ratio of negative to positive behaviors occurred in the woodworking and dolls/dollhouse centers. Some negative behaviors also occurred in the housekeeping and art centers. Few, if any, negative behaviors were observed in the other centers.

Neither the positive/negative behavior by gender interaction nor the three-way interaction was significant. Thus, positive and negative behaviors occurred in equal ratios for boys and girls in all centers.

Discussion

In contrast to prior play-center research, play centers, not children, were randomly observed, and the data were analyzed by means of a log-linear technique. In view of the methodological differences, it is surprising that these results provided as much support as they did for previous findings on boys' and girls' play-center preferences and on the influence of play centers (or play materials) on boys' and girls' social behaviors.

In toy preference our findings were consistent with others in showing that all play centers were not used equally but that some were far more popular than others. The finding that the housekeeping center was the most preferred supported the observations that McDowell (1937) and Parten (1933) made of children several generations ago. As did McDowell (1933) and Shure (1963), this study found art and books also to be popular centers. Parten (1933) found that sand was the most frequently used material. Fifty years later, with more

sophisticated methodology, we also found sand to be popular. In contrast to Parten (1933), we found the dolls and dollhouse to be among the least frequently used items; but the difference may simply reflect a different methodology, rather than a change in children's interest in dolls. Parten combined dolls with housekeeping, the most popular center in both her study and ours. In contrast to McDowell's (1937) finding that materials requiring "manipulative skill of small muscles" were among the most frequently used, we found the manipulatives center to be the least frequently used. This inconsistency could be due either to greater interest in physical development and emphasis on small muscle activities in the 1930's or to the improved methodology of the present study.

Boys and girls showed different preferences for the different centers. Boys significantly outnumbered girls in woodworking, manipulatives, and language. Girls preferred the housekeeping, painting, and games centers. The girls' preference for housekeeping has been observed over several generations (Clark, Wyon, & Richard, 1969; McDowell, 1937). The combination of this preference, and the boys' interest in manipulatives and woodworking, suggests that certain play materials are sex typed in the 1980's, just as they were in the 1930's.

Although we were interested in the interactions of play centers and social behaviors, rather than in the incidence of social compared to nonsocial behavior, we observed significantly more social than nonsocial behavior. The finding that 65% of the observations involved

social interactions may result from the teachers' lack of interference with the children's activities while the observations were being made.

The social/nonsocial behavior by play center interactions indicated that more social than nonsocial behavior occurred in the dolls/dollhouse, games, housekeeping, sand, and manipulatives centers. When children did play in the infrequently-used doll/dollhouse center, they tended to play with others. This finding lends some support to Parten's (1933) observation that the most complex social behavior occurred in her combination doll and housekeeping center and to the findings of Shapiro (1975) and Shure (1963) that the most complex social interactions occurred in the doll center. We found games to be the second highest center (after dolls) in social activity. Children tended to play in solitary or parallel fashion in the language, paint, and art centers. Rubin (1977) also found that nonsocial behavior was predominant when children engaged in painting and art activities. The reason that low social activity occurred in the language center may be that the activities there were highly structured and lent themselves to individual activity.

Although the overall incidence of positive and negative behaviors was not the focus of this study, we did find more positive than negative social behavior. This finding corroborates the observations of several investigators; and, as observed in other studies of this age level (e.g., Campbell & Cluss, 1982), negative social interactions occurred infrequently. However, when they did

occur, as indicated by the play center by positive/negative behavior interaction, negative behaviors were more likely to take place in some centers than in others. Both Shapiro (1975) and Shure (1963) observed the tendency for more negative behavior to occur in the doll and block areas. Consistent with those observations is the present finding of a greater frequency of negative behavior in the dolls/dollhouse and woodworking centers than in the other centers.

The finding that the positive/negative behavior by gender interaction was not significant provides one more bit of evidence on the side of no gender effects in the controversy concerning biological sex differences in aggression (Maccoby & Jacklin, 1980; Tieger, 1980). This finding, in conjunction with the finding of a play center by positive/negative behavior interaction, lends some support to the Maccoby and Jacklin (1980) contention that "aggressiveness is not so much a characteristic of individuals as it is a quality that characterizes certain pairs or groups under specific soliciting conditions" (p. 977).

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Author Notes

A version of this paper was presented by Jane H. Weaver at the annual convention of the American Psychological Association, Toronto, August, 1984.

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Table 1

Description of Centers

Center	Description
Art	Round table containing arts and crafts activities; cutting, gluing, coloring and other similar activities prepared by the teacher.
Books/ Listening	Tape recorder with earphones for listening to books; books for independent reading.
Dolls/ Dollhouse	Dolls and dollhouse equipped with items such as dishes and furniture.
Housekeeping	Play furniture; dishes and utensils; dolls; grocery items; toy housekeeping items (e.g., broom, iron); semi-enclosed by a wooden rail on one side and walls on three sides.
Language	Activities centered on a table; language arts worksheets; activities designed by teachers to promote development of prereading skills.

(table continues)

Center	Description
Manipulatives	Carpeted floor play area; Lincoln Logs; Tinker Toys; Legos, etc.
Math	Round table on which activities were centered; worksheets; games; manipulatives; flash cards, etc.
Painting	Two easels; paint brushes; paint; paper; smocks.
Games	How storage shelves with adjacent carpeted area; wooden puzzles; a variety of board games.
Sand	Large round plastic container of sand; apparati and vessels for measuring, sifting and pouring.
Woodworking	Small carpeted area just inside a space partitioned with half-walls; hammers; saws; nails; pieces of wood; old machine parts.

Table 2

Frequency of Social and Nonsocial Behaviors by Play Center and Gender

Behaviors	Art			Books			Dolls/Dollhouse			Games/Puzzles		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Social	41	116	157	30	105	135	36	46	82	36	195	231
Non-social	42	151	193	38	130	168	0	17	17	16	37	53
Total	83	267	350	68	235	303	36	63	99	52	232	284
Behaviors	Housekeeping			Language			Manipulatives			Math		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Social	85	577	662	22	16	38	48	1	49	20	74	94
Non-social	33	166	199	49	16	65	27	0	27	29	66	95
Total	118	743	861	71	32	103	75	1	76	49	140	189
Behaviors	Paint			Sand			Woodworking					
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total			
Social	6	53	59	70	126	196	136	34	170			
Non-social	6	89	95	16	52	68	29	17	46			
Total	12	142	154	86	178	264	165	51	216			